

CLAIMS

What is claimed is:

1. A method of compiling a program to be executed on a target  
5 microprocessor, the method comprising:  
identifying a cycle during which a functional unit would otherwise be idle;  
opportunistically scheduling a diagnostic operation for execution on the  
functional unit during that cycle; and  
scheduling a comparison of a result from executing the diagnostic  
10 operation with a corresponding predetermined result.
2. The method of claim 1, further comprising:  
predetermining a test pattern of diagnostic operations and corresponding  
predetermined results for the functional unit.  
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3. The method of claim 1, further comprising:  
causing a flag in the target microprocessor to be set when the comparison  
indicates an error.
- 20 4. The method of claim 3, further comprising:  
if the error flag is set, then halting the execution and causing a  
notification to a user of the error flag.
5. The method of claim 1, further comprising:  
25 setting a user-selectable level ('slider') for an aggressiveness of said  
opportunistic scheduling.
6. The method of claim 1, wherein the functional unit comprises a floating  
point unit.
- 30 7. The method of claim 1, wherein the functional unit comprises an  
arithmetic logic unit.

8. The method of claim 1, wherein the functional unit comprises one of multiple functional units of a same type within the target microprocessor.
9. The method of claim 1, wherein the method is performed by a scheduler  
5 in a code generator of a program compiler.
10. The method of claim 9, wherein the program compiler comprises a native compiler for the target microprocessor.
- 10 11. The method of claim 9, wherein the program compiler comprises a cross compiler run on a different microprocessor.
12. A program compiler for a target microprocessor, the compiler comprising a code generator including a scheduler that identifies a cycle during which  
15 a functional unit would otherwise be idle, opportunistically schedules a diagnostic operation to be executed on the functional unit during that cycle, and schedules a comparison of a result from executing the diagnostic operation with a corresponding predetermined result.
- 20 13. The compiler of claim 12, wherein the functional unit comprises one of multiple functional units of a same type within the target microprocessor.
14. The compiler of claim 12, wherein the scheduler selects the diagnostic operation from a test pattern of diagnostic operations.
- 25 15. A computer-readable program product for execution on a target microprocessor, the program product comprising executable code that includes a diagnostic operation scheduled for a functional unit that would otherwise be idle during a cycle and also includes a subsequently  
30 scheduled comparison of a result from executing the diagnostic operation with a corresponding predetermined result.